



Attorney Docket No.: SEL 139 DIV

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)
Shunpei Yamazaki et al.)
Serial No.: 09/808,162)
Filed: March 13, 2001)
For: Method For Fabricating A)
Semiconductor Device)

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Signature Connie Janus Morris
Date 5/4/2001

Commissioner for Patents
Washington D.C. 20231

PRELIMINARY AMENDMENT

Dear Sir:

In the specification, on page 1, delete the cross reference to the related application and insert the following:

CROSS REFERENCE TO RELATED APPLICATION

This application is a continuation of copending U.S. Application Serial No. 09/386,782 filed on August 31, 1999.

In the Claims:

Please amend claims 1-3.

1. (Amended) A method of fabricating a semiconductor device, said method comprising the steps of:

preparing a single crystal semiconductor substrate having a main surface of a {110} surface;

forming an oxide layer in the single semiconductor substrate;

adding hydrogen into the single semiconductor substrate from a side of the main surface through the oxide layer to form a hydrogen-containing layer in the single crystal semiconductor substrate;

bonding the single crystal semiconductor substrate and a supporting substrate to each other;

separating the single crystal semiconductor substrate by a first heat treatment along the hydrogen-containing layer;

polishing a single crystal semiconductor layer remaining on the supporting substrate and having a main surface of a {110} plane; and

forming an active layer of a thin film transistor by using the single crystal semiconductor layer.

2. (Amended) A method of fabricating a semiconductor device, said method comprising the steps of:

preparing a single crystal semiconductor substrate having a main surface of a {110} surface;

first oxidizing the single crystal semiconductor substrate to form a porous semiconductor layer;

carrying out a first heat treatment on the porous semiconductor layer in a reducing atmosphere;

carrying out an epitaxial growth of a first single crystal semiconductor layer having a main surface of a {110} plane on the porous semiconductor layer;

second oxidizing the first single crystal semiconductor layer to form an oxide layer, wherein a remaining portion in the first single crystal semiconductor layer which is not oxidized in the second oxidizing step is defined as a second single crystal semiconductor layer;

bonding the single crystal semiconductor substrate and a supporting substrate to each other;

polishing the single crystal semiconductor substrate until the porous semiconductor layer is exposed;

removing the porous semiconductor layer to expose the second single crystal semiconductor layer; and

forming an active layer of a thin film transistor by using the single crystal semiconductor layer over the supporting substrate.

3. (Amended) A method of fabricating a semiconductor device, said method comprising the steps of:

preparing a single crystal semiconductor substrate having a main surface of a {110} surface;

adding oxygen ions into the single semiconductor substrate from a side of the main surface to form an oxygen-containing layer in the single crystal semiconductor substrate;

converting the oxygen-containing layer into a buried oxide layer by a heat treatment, wherein a single crystal semiconductor layer having a main surface of a {110} plane remains on the buried oxide layer; and

patternning the single crystal semiconductor layer to form an active layer of a thin film transistor.

Please add new claims 13-14.

13. A method according to claim 1 further comprising the step of:

carrying out a second heat treatment at a temperature of 900 to 1200°C.

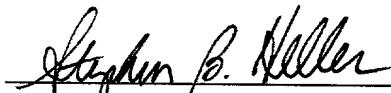
14. A method according to claim 2 further comprising the step of:

carrying out a second heat treatment at a temperature of 900 to 1200°C.

REMARKS

The above amendment is made to correct the misidentification of the present application as a "divisional" -- it is a continuation -- and to more specifically set forth the invention that is the subject of the application.

Respectfully submitted,


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Date: May 4, 2001

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ATTACHMENT

CROSS REFERENCE TO RELATED APPLICATION

This application is a continuation [divisional] of copending U.S. Application Serial No. 09/386,782 filed on August 31, 1999.

1. (Amended) A method of fabricating a semiconductor device, said method comprising the steps of:

preparing a single crystal semiconductor substrate having a main surface of a {110} surface;

forming an oxide layer in the single semiconductor substrate;

[forming] adding hydrogen into the single semiconductor substrate from a side of the main surface through the oxide layer to form a hydrogen-containing layer [at a predetermined depth] in [a] the single crystal semiconductor substrate [having a main surface of a {110} plane];

bonding the single crystal semiconductor substrate and a supporting substrate to each other;

separating the single crystal semiconductor substrate by a first heat treatment along the hydrogen-containing layer;

[carrying out a second heat treatment at a temperature of 900 to 1200°C;]

polishing a single crystal semiconductor layer remaining on the supporting substrate and having a main surface of a {110} plane; and

forming [a plurality of TFTs each having] an active layer of a thin film transistor by using the single crystal semiconductor layer.

2. (Amended) A method of fabricating a semiconductor device, said method comprising the steps of:

preparing a single crystal semiconductor substrate having a main surface of a {110} surface;

first oxidizing the single crystal semiconductor substrate [forming] to form a porous semiconductor layer [by anodic oxidation of a single crystal semiconductor substrate having a main surface of a {110} plane];

carrying out a first heat treatment [to] on the porous semiconductor layer in a reducing atmosphere;

carrying out an epitaxial growth of a first single crystal semiconductor layer having a main surface of a {110} plane on the porous semiconductor layer;

second oxidizing the first single crystal semiconductor layer to form an oxide layer, wherein a remaining portion in the first single crystal semiconductor layer which is not oxidized in the second oxidizing step is defined as a second single crystal semiconductor layer;

bonding the single crystal semiconductor substrate and a supporting substrate to each other;

[carrying out a second heat treatment at a temperature of 900 to 1200°C;]
polishing the single crystal semiconductor substrate until the porous
semiconductor layer is exposed;

removing the porous semiconductor layer to expose the second single crystal
semiconductor layer; and

forming [a plurality of TFTs each having] an active layer of a thin film
transistor by using the single crystal semiconductor layer [on] over the supporting
substrate.

3. (Amended) A method of fabricating a semiconductor device, said method
comprising the steps of:

preparing a single crystal semiconductor substrate having a main surface of a
{110} surface;

adding oxygen ions into the single semiconductor substrate from a side of
the main surface [forming] to form an oxygen-containing layer [at a predetermined
depth] in [a] the single crystal semiconductor substrate [having a main surface of a {110}
plane];

converting the oxygen-containing layer into a buried [insulating] oxide
layer by a heat treatment, wherein a single crystal semiconductor layer having a main
surface of a {110} plane remains on the buried oxide layer; and

[forming a plurality of TFTs each having] patterning the single crystal
semiconductor layer to form an active layer of a thin film transistor [a single crystal
semiconductor layer having a main surface of a {110} plane on the buried insulating
layer].